LIBRARY JOURNAL

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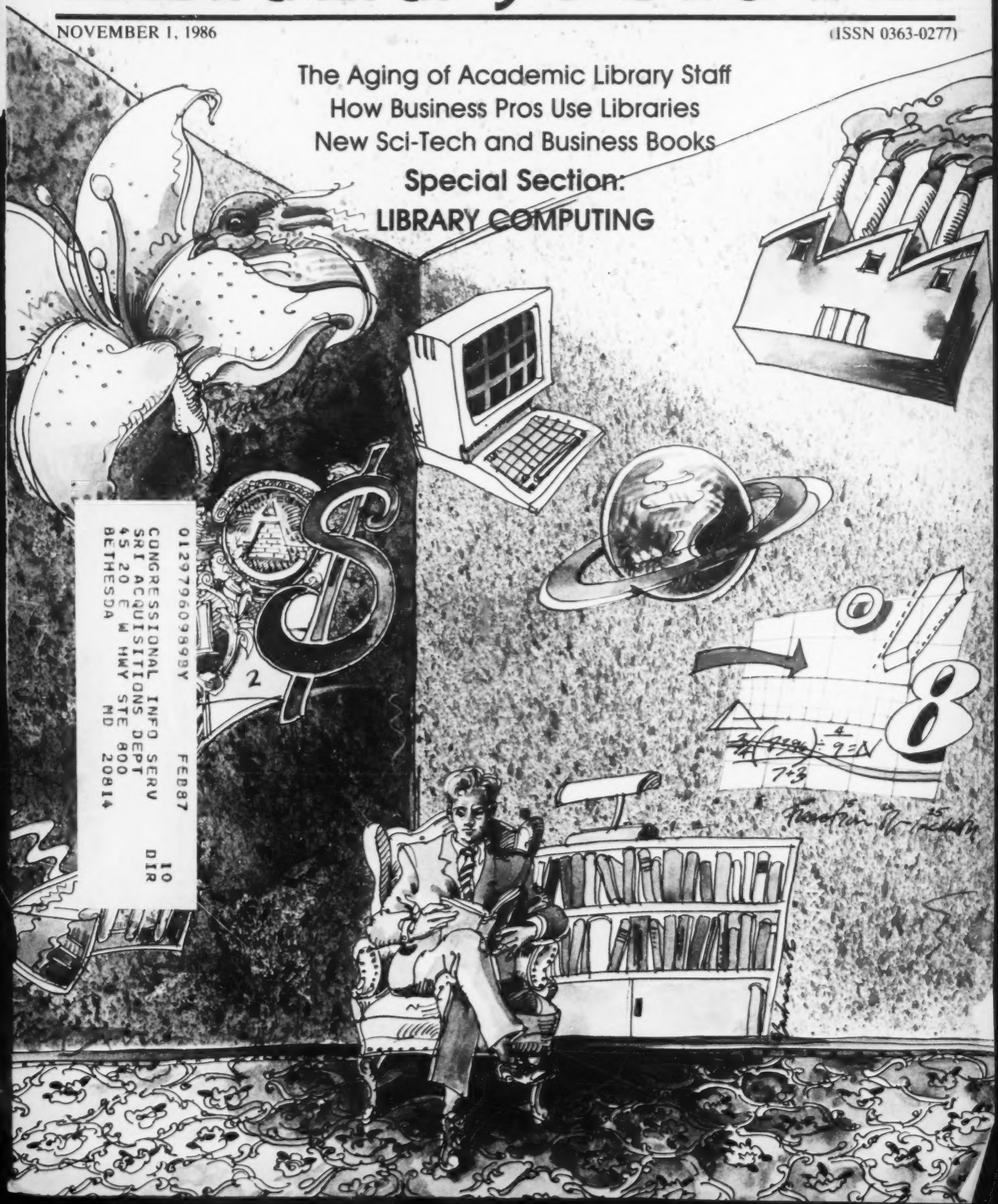
LIBRARY COMPUTING



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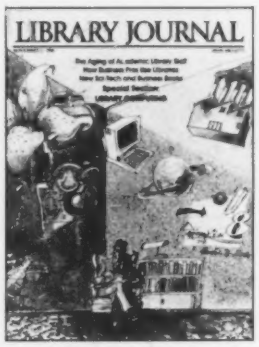

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LIBRARY COMPUTING

A SPECIAL SUPPLEMENT TO *LIBRARY JOURNAL*

Automation and the Invisible Patron
Electronic Bulletin Boards
New Research on Library Automation

The Economy of Library Automation

Library Computing, our name for these special, semi-annual sections of *Library Journal*, of which this is our fourth, is designed to provide basic and introductory articles on various aspects of library automation, and to "grow up" with the library field as it automates. Two essential aspects of that growing up are reflected in this edition of *Library Computing*.

The first is that the contents of this special section will appear only in *Library Journal*. We shared the first three special sections with our sister publication *School Library Journal*, which is now developing its own editions of *Library Computing*. That we must now specialize *Library Computing* for the audiences of the two magazines reflects the rapid maturity of library automation.

The second aspect of the maturing of library automation lies in the fact that the field is increasingly seen as a lucrative market by a host of manufacturers and vendors who offer a tremendous variety of computerized products, both hardware and software, aimed directly at libraries. One such company, our parent, R.R. Bowker, has developed an electronic version of its best-known print database, *Books in Print*, on the new darling of the database world, compact disc read-only memory, or CD-ROM.

Library automation, until recently and like every other activity in the early stages of automation, was driven by the technology. Pioneer libraries purchased the early circulation systems while others waited for the stability that comes only after experience with a new technology. Other early birds subscribed to online database services before the current proliferation of such databases, while others waited until the utility of those information sources was clear.

The same pattern was seen in the adoption of microcomputers to library functions, and the library pioneers will be the first to show you the attics and storerooms cluttered with the early "computers" with their limited capacities, most of which are now junk. When "Big Blue" (IBM) introduced its Personal Computer, less courageous librarians finally bought in, declaring that with the advent of the IBM PC a de facto standard had been established.

When Bowker began to market its CD-ROM *Books in Print*, it became obvious that there were really very little hard data on the *economy* of library automation, so like the study of microcomputers in libraries commissioned by *LJ* in connection with our first *Library Computing* (see *LJ*, May 1, 1985), Bowker asked the research arm of its new parent, Cahners Research, to take a look at the economy of library automation.

Bowker has kindly shared the Cahners Library Technology Survey, which was completed in September, with us for publication in *Library Computing*. We have developed a number of tables, which appear throughout this issue of *Library Computing*, as the easiest way to share with our readers the results of this glimpse of the economy of library automation.

From the tables you will find out, for example, that IBM and IBM-compatible microcomputers dominate the library market. You will see that 75 percent of the libraries have spent substantial amounts, from $5000 to $100,000, on library automation over the past five years, and more than 16 percent have spent $100,000 or more! You will see that almost 80 percent of the libraries own a microcomputer, most own three, and the average memory of those PCs is 285.8K.

The Cahners research shows that more than 40 percent of the libraries currently use some kind of local automation system. You will learn that while only about eight percent of the libraries own a CD-ROM player, 25 percent expect to get one within a year. The research also shows that in the selection of new information technology for libraries, while top administration in libraries makes the final decisions, reference and technical services librarians are deeply involved in the decision-making process.

The key point in all of this is that with each new issue of *Library Computing*, we find not only great progress and real change in the automation of U.S. libraries, but also new maturity. This glimpse into the economy of library automation reveals a level of progress and maturity that clearly means more clout for librarians in the development of standards and compatibility in technology, and a larger share of the manufacturing dollars spent on research and development spent on improving old products and developing new ones directly aimed at a growing market that demands attention.

John Berry

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LIBRARY COMPUTING COVER ILLUSTRATION BY JOHN WARD

High Tech/Low Profile: Automation & the "Invisible" Patron

By Bernard G. Sloan

PUBLIC ACCESS to automated library systems has been an increasingly popular topic of late. As more libraries automate their operations, public access plays an integral part in the system's planning process. Many conferences and publications feature speakers and writers touting the virtues of various systems' user friendliness. This increased emphasis on giving the public online access to library holdings is very appropriate. Properly designed systems have the potential to greatly increase and enhance access to library resources.

One broadly based automated system has seen considerable experience with online public access. The Statewide Library Computer System (LCS) has allowed public access for more than seven years. Public access to LCS began in 1978 at the University of Illinois, and in 1979 at Triton College. As LCS membership grew, so did the popularity of allowing public access. Today, 24 LCS libraries allow users to directly access the system, some even allowing patrons to initiate circulation transactions.

The system as a whole supports more public access terminals than most other systems *have* terminals. About 40 percent of the LCS terminal base—253 terminals—are reserved for patron use. In one recent month, LCS library patrons initiated nearly 1.5 million transactions, including 30,000 circulation transactions. Patrons have initiated well over 50 million transactions since public access to LCS was first offered.

Bernard G. Sloan is Manager, Library Systems User Services, University of Illinois, Urbana

Remote public access

While public access to LCS has proven to be a huge success with library patrons, there is a subset of this activity that constitutes a leading edge of what could be called the "second wave" of online public access. This activity can be termed remote public access, i.e., the capability to access an automated system from a location independent of the physical library itself. LCS has allowed remote public access, in varying degress, also for seven years. Remote access to LCS can be achieved in one of two ways: dialing directly into the system or accessing an institution's academic computing network.

"Remote public access offers the potential to greatly benefit library patrons. But . . . the potential problems are many"

Seven LCS libraries presently allow remote patron access to the system. While only 25 computer "ports" are dedicated to this form of access, such access is popular, and usage is on the upswing. Two libraries have experienced increases of 79 percent and 295 percent, respectively, in LCS usage through local academic computing networks over the past year. And the demand should continue to grow as more and more people acquire microcomputers and become familiar with the advantages of using a micro to communicate with other computer systems.

Remote public access offers the potential to greatly benefit library patrons. But like any introduction of new technological capabilities, the potential problems are many. While LCS is only one specific system, some observations made from seven years of experience with remote access should prove helpful to those libraries considering this next step.

The benefits of offering remote public access to automated library systems are obvious. Access to library resources is greatly expanded. More people are able to gain access to information about the library's resources from more physical locations, more conveniently. Access to this information can be less time dependent, i.e., the system can be available for more hours than the library is open. Not quite so obviously, remote access serves to blur the concept of the library as a physical location or building. This shift in perception is significant, as patrons begin to think of (and judge) the library in terms of what it offers to them—"what" the library is, rather than "where."

Remote patrons

Remote access to the library offers many possibilities: increased and enhanced access to information about the library's holdings; an increased emphasis on "service" as opposed to physical presence; etc. But remote access also offers many potential pitfalls, due mainly to the fact that the "invisible" patron can be quite a different animal than the "standard" library patron.

The behavior of remote patrons can differ substantially from the behavior of in-house patrons, even

those patrons who make use of on-site public access terminals. Remote users are less likely to remain satisfied with an automated system that emulates "traditional" access. For example, remote users who can access bibliographic descriptions about library holdings may begin to wonder why they have to go to the "physical library" to get the items.

There will be remote users, some quite influential, who will base their impressions of a library and its services solely on their experiences as "invisible patrons." Library personnel and administrators may feel that in-house services are topnotch, but those same energies must also be applied to dealing with the "invisible library" and its patrons. Failure to do so can be damaging.

Remote controls

As library personnel begin planning for service to the invisible patrons, they would be wise to consider the following points:

- Above all, remote access should not be offered until library personnel are fully prepared to deal with it. Poorly prepared projects can be public relations disasters. Even a good system can come across poorly if the proper support is lacking.
- Try to piggyback on existing networks. Whether it's a local area network (LAN), an academic computing network, or a cable TV system, utilizing an already existing network will reach an established audience, and may make development easier and less costly. If no suitable network exists, opt at first for dial access via telephone lines. Investigate the dial access option, even when working with an existing network, to ensure a broadly based potential audience.
- Remote access should be phased in gradually, even when advance preparations have been finalized. The project should begin with limited access, and should not be expanded until patron feedback, etc., have been received and evaluated.
- Invisible patrons behave differently than in-house patrons. Staff experience in using a system should not be the sole source of input in planning. Experience with LCS shows radically different patterns of use when staff use of the system is compared to remote use. Be careful of interpreting any in-house public access experiences as being wholly representative of remote user behavior. For example, remote users access a system more frequently on evenings and weekends than do users of on-site public access terminals. The mix of commands used by remote LCS patrons differs markedly from patterns of use at nonremote public terminals.
- How will library staff communicate with the invisible patron? The patrons who need help the most are potentially the hardest to reach. LCS remote access ports have the highest error rates of any discrete group of "terminals" in the system, noticeably higher than even on-site public terminals. And while LCS remote users accounted for less than two percent of total system activity during one recent month, they initiated 26 percent of all "help" commands. Any communication with remote users has to be a two-way street. The patron needs information on how to use the system, and the library needs to know what patrons think of the system generally, as well as any specific problems individual patrons may have. Ideally, such communication capabilities should be built into the system itself. And the remote patron should be able to readily determine who to contact by telephone should questions, problems, etc., arise.
- Patrons can't be truly remote unless they can request items they've located through a search. Seriously consider allowing remote circulation capabilities. LCS remote patrons have initiated more circulation transactions (as a group) in a single month than have the circulation staffs of 14 LCS libraries, when taken individually. If patrons are allowed to charge items from their homes, offices, etc., it will alleviate the frustrations they may feel at being able to locate items remotely while being required to come to the physical libraries to charge them out. If allowing charge transactions won't work for logistical (or political) reasons, a library should at the very least allow remote renewals, as well as the placement of saves on items held by other patrons.
- If a library allows patrons to charge items remotely, document delivery becomes an issue. Some patrons will see remote charging without document delivery as an incompletc service. Try to utilize an existing document delivery system, if possible. If an existing system is used, be sure to involve that system's management in the planning process.
- Prepare for the inevitable requests for electronic access beyond bibliographic descriptions of items held by the library. Remote patrons will be interested in full-text retrieval, commercial databases, etc. If it's not feasible to provide such access, be prepared to explain why.
- Always remember Mooers's law: "An information system will tend not to be used whenever it is more painful and troublesome for a customer to have information than for him not to have it." Consider Sloan's corollary: "The easier an information retrieval system is to use, the more likely it is that the user will eventually request information he or she doesn't really need, and won't use." Well-designed remote access will result in an increased demand for library materials. Depending on ease of use, a substantial portion of this increased demand may be for items that are at best marginally useful to the patron. The impact of Sloan's corollary will vary from situation to situation. Be apprised that it happens, and consider it for what it's worth.

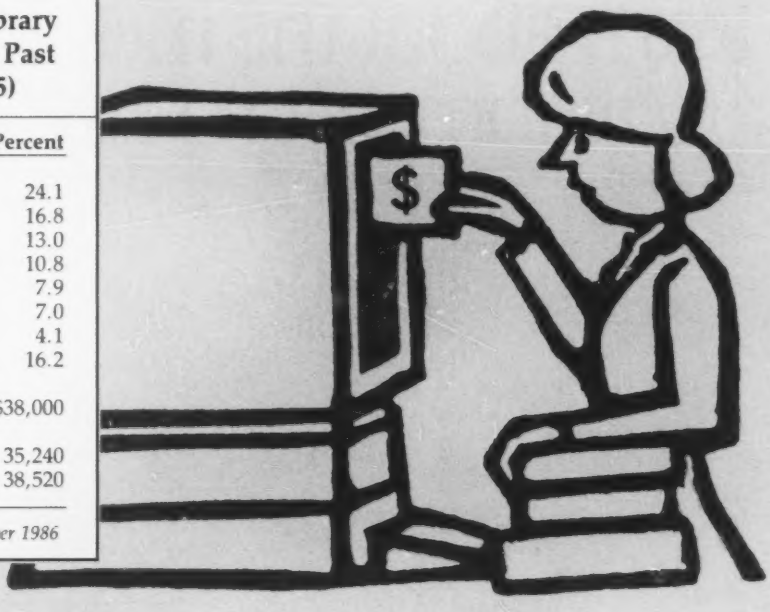
"Remote access is a logical, even inevitable, extension of on-site public access"

Remote access is a logical, even inevitable, extension of on-site public access. Librarians everywhere would be doing their patrons (and potential patrons) a great disservice by not seriously considering remote access to automated library systems. While remote access may initiate some fundamental changes in patrons' perceptions of the library, one thing remains fundamentally unchanged: libraries exist to serve the information needs of library users. Anything that can serve to increase or enchance that access is well worth considering.

TABLE 1
Amount Spent on Library Automation over the Past Five Years (N=315)

Amount	Percent
Under $5,000	24.1
$5,000–9,999	16.8
$10,000–19,999	13.0
$20,000–29,999	10.8
$30,000–49,999	7.9
$50,000–74,999	7.0
$75,000–99,999	4.1
$100,000 or more	16.2
Mean expenditure	$38,000
Academic libraries	35,240
Public libraries	38,520

Source: Cahners Research, September 1986



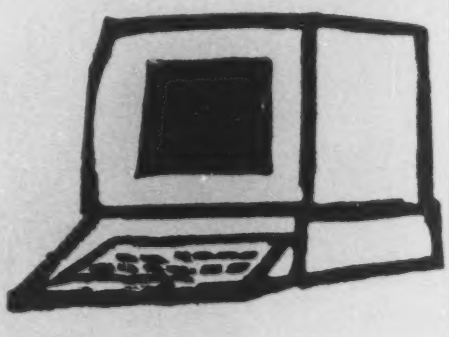


TABLE 2
Types of PCs at Academic and Public Libraries

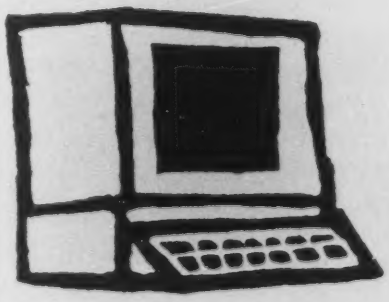
	Overall	Academic	Public
IBM	2.70	3.20	1.99
IBM Compatible	2.85	4.54	1.69
Net IBM	5.55	7.74	3.68
Apple	3.28	5.69	1.78
Other	2.31	2.55	2.05
Total	**11.10**	**16.00**	**7.50**

Source: Cahners Research, September 1986

TABLE 3
Mean Number of PCs in Each Area

	Overall	Academic	Public
Reference	1.59	1.79	1.38
Interlibrary loan	1.12	1.11	1.14
Circulation	1.46	1.18	1.87
Cataloging	1.52	1.61	1.36
Acquisitions	1.13	1.10	1.14
Administration	1.67	2.00	1.42
Other*	3.97	6.37	1.77

* *Children's Room, Computer Center, AV Center*
Source: Cahners Research, September 1986



Results of a 1985 survey on micro-based online databases

Electronic Bulletin Boards: Applications in Libraries

By Patrick R. Dewey

THE KEEN INTEREST in microcomputer-based, electronic, online, dial-up database services (electronic bulletin board systems) by libraries was evidenced when more than 300 librarians listened to a two-hour panel discussion at the ALA Conference in Chicago on July 8, 1985. Program possibilities, technical problems, maintenance, training of staff, and software/hardware selection were discussed.[1]

For those not familiar with the electronic bulletin board (commonly known as the BBS for Bulletin Board System), it is a database which parallels the paper bulletin boards so often seen at grocery stores or other public places. Its chief attributes are electronic mail, news items and feature stories, and other upload/download files for staff or public, but patrons generally access it from a remote location with the aid of a microcomputer and modem. This definition also includes many micro-based electronic mail systems (even though operators of some such systems do not refer to their operation as a "BBS").

The use of an online database for library work is not new. A survey conducted from July 1984 to approximately July 1985 returned all kinds of online database systems that could be defined as electronic bulletin board systems providing a wide array of services for staff and public. Many of these systems have nothing to do with microcomputers; some were operated as a network on a mini or mainframe computer as part of their service (e.g., the Source or CompuServe, ARPANET or ALANET); and some even operated over a cable system. A literature search also found that one library district operates a network for 96 library locations using a DEC PDP 11/70 and DEC PDP 11/44 to automate or speed up nearly every traditional library function.[2] Local area networks (LAN) were reported by several college libraries.

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Low cost of BBS

The microcomputer-based BBS has distinct advantages (and disadvantages) over other systems. Primarily, most other types of systems (e.g., mainframe or mini, cable, etc.) are just too costly to be available for use by most small or medium-size libraries. And while a library may hook up to ALANET for electronic mail, it still would have nothing which would provide for a public access board. A microcomputer may cost nothing extra, if already owned by the library, or will be a small investment, if purchased new for such a project. Nor does it require great technical skill to set up and operate.

Some libraries reported it more cost effective for a local group to set up their own local bulletin board system for interlibrary loan than to attempt to coordinate such efforts through a third party system. Minor cost and off-the-shelf ease are also reflected in the fact that more than 1000 micro-based boards in existence in the United States are nearly all run by individuals from their homes or small businesses.

Public access & networking

Born in 1977,[3] the BBS finally made its way into a public library in November 1981.[4] Since my first article about the BBS at North-Pulaski was published in 1982, I have been receiving letters requesting information on how a library goes about setting up and operating a BBS, and it seemed time to take a census of library-operated bulletin boards. First, to see what had been done and, second, what library-specific problems had been encountered.

In the case of libraries, such services may be divided into two types: public access and professional networking—both electronic enhancements of the library's traditional role or needs. But it is not without problems. What happens when the diskettes at the library are seized by the Secret Service for alleged illegal activity? In the case of public access, how does one control electronic graffiti? Is the library responsible for comments or illegal materials left online by the public? What about censorship, since this is a form of publishing?

These are just some of the myriad problems and issues facing the handful of adventurous library "sysops" (system operators) who run electronic bulletin boards from their library. Answers to some of these issues are found below, others are not and will take considerably more effort on the part of the library community to resolve. Despite the problems, these people are all unanimous on one point: there are few things as exciting, intriguing, or popular with their public as the electronic BBS.

Survey methodology

One thing seemed obvious from the start: a search for library-operated electronic bulletin boards would be very much like looking for a needle in a haystack, with no guarantee that there would be a needle. Two copies of the survey were sent to all 50 state libraries, along with a request that a copy (or photocopy extras if needed) be mailed to anyone in the state that might be operating a BBS.

Also enclosed was a press release that requested that anyone op-

erating a BBS contact me for a copy of the survey. The deadline for return of the survey was set several months ahead to allow it to be included in library system newsletters in each state. Individual press releases were sent to library journals and newsletters, and notices appeared in such diverse places as *American Libraries*, *Kansas Library Automation News*, *Small Computers in Libraries*, and *The Wired Librarian*. Individual copies of the survey were also mailed to anyone who had requested information about a library BBS in the past. Statistical and anecdotal data used are a result of these methods.

Small statistics

Most of the statistics can be counted on one's fingers. The totals are, alas, small. Several other additional bulletin boards are rumored operating, but were either impossible to confirm or did not respond to the survey.

As small as these numbers might seem to some, they show a definite trend: we are inexorably moving in the direction of wider use of microbased electronic bulletin boards by libraries. As of late 1981, there was just one BBS operated by a library. As of mid-1985, there were 20 others in existence or being planned. Of boards already in existence, public libraries have taken a definite lead (six or 40 percent), as have public access boards (eight or 53 percent).

Selecting software

There are three different ways to secure microcomputer software for maintaining an online, dial-up database: buy an "off-the-shelf" system, develop a flexible database system such as dBase, or do original programming. Of the 15 libraries reporting a BBS, 12 (79.2 percent) chose off-the-shelf software, one (6.6 percent) developed a database system, and two (13.3 percent) programmed their own.

Currently available BBS software is hardly perfect, since a lot of it is apparently intended to be used by programmers or by people who could devote large amounts of time and energy to fiddling with it. The documentation for many systems, when it exists at all (in particular PMS and ABBS), is difficult to read, since it is taken for granted that many things not mentioned in the text are understood.

CP/M software can require a great deal more "fiddling" than off-the-shelf programs, since some of it is not sold per se as a BBS but must be "developed" by the purchaser, and may require a knowledge of CP/M as well as a computer with CP/M capability. Also, very few BBS operators have published accounts of how well their software works, and it is also true that there are very few printed lists of names and addresses of off-the-shelf bulletin board software. (However, this has apparently changed with the advent of the newsletter *Bulletin Board Systems*, which has an annual listing of such software and, to some extent, reports on software problems.)

Constructing such programs out of major database management systems such as *dBase* is possible, but this requires the learning of a special programming language and can take a great deal of time. Some libraries have created their own software. That used by the San Bernardino Public Library (California) appears to function well—it was written by a staff member and is not yet available commercially. However it is done, it can take literally months to find out just how well a software program will do the job, since hidden bugs may take that long to surface.

TABLE 1
Number of Systems in Operation by Type of Library

	In Operation	Planning	Closed Down
Academic	1	1	
Library school		1	
Library system or group	5		
Public	6	1	
School	1		
Special	1	1	1
State Library	1	2	
Total	**15**	**6**	**1**

TABLE 2
Features and Sources of BBS Materials

Feature	Source
Articles	Staff and Public Reprints
Advice Column	Staff
Book Reserves	Staff
Book Reviews (Juvenile/Adult)	Staff and Public
Book Sale Dates	Staff
Booklist Computer Reviews	Booklist
Chat with Sysop (if available)	Staff and Public
Continuing Education Listings	Staff
Electronic Mail	Staff and Public
Interlibrary Loan	Staff and Public
Library Information (programs, addresses, board members, etc.)	Staff
Local BBS numbers listing	Courtesy other BBS
Movie Reviews (Juvenile/Adult)	Staff and Public
New Book Lists	Staff
Newsletters	Republication/Staff
Pet Health Column	Public
Placement Service	Staff
Poetry Column	Public
Public Service Numbers	Staff
Puzzles (word find, etc.)	Staff
Reference Questions	
Restaurant Column	Public
Soap Opera Digest	Public

TABLE 3
Microcomputer, Online, Dialup Databases

Library	BBS number	Hours "up"	Baud	Hardware
*Faulkner-Van Buren	301-327-7490	6 pm-8 am	300/1200	IBM PC, 20MB
Illinois State	800-637-8855	24 hours	300/1200	Victor 9000
*Liverpool	315-457-3144	E/WE	300	Apple IIe
Loma Linda	unpublished	24 hours	300/1200	Compaq
Montgomery County	unpublished	working hrs.	300	Apple
Mountain-Valley	unpublished	working hrs	300	TRS 80 IV
*North-Pulaski	312-235-3200	E/WE	300	Apple II+
*Odessa College	915-335-6660	E/WE	300	Apple IIe, 10MB
ODIN	unpublished		1200	TRS-80
Palinet-OCLC	unpublished	24 hours	300/1200	Columbia 1600-4
*San Bernadardino	714-884-4922	E/WE	300/1200	Apple II+, 10MB
*Spokane	509-838-4726	E/WE	300	IBM PC
*Suburban & Maywood	312-343-0100	24 hours	300	Apple IIe, 10MB
*Waukegan	312-623-2226	E/WE	300	Apple II+
Wisconsin Ref. & Loan	unpublished	8:30 am-4 pm	1200	IBM PC

* = *Public Access Board*
E/WE = *Evenings/Weekends*

No library seemed to think that it had solved all the problems of software. Chief features considered were crash resistance, ease of use, documentation, and security. It seems apparent that libraries would benefit from a well-tested, well-documented, standardized package, since knowing where to begin in such a selection process can be difficult. Even so, more information about libraries and micro-based bulletin boards now exists than did just a year or two ago. In the long run, if the BBS survives, user groups will come to the rescue by sharing such information, just as they have in all other areas of microcomputing.

Hardware factors

Three factors separate the hardware used in libraries: mass storage available for files, baud rate, and microcomputer brands. Storage capacity, specifically in the number or type of disk drives available, yielded the greatest differences. Two libraries use a hard disk drive online, and another has three five-inch Apple drives. The others are using two standard five-inch drives. Those libraries with a hard disk drive are able to provide a much larger database to their public.

Baud rate varies from only 300, only 1200, or both. How much having both improved service is not known, since the majority of callers to a public access board have only 300 baud capability. A board run for a university or for librarians instead of the general public may have a different clientele, but it was not determined from this survey whether or not a significantly higher percentage of such patrons had 1200 baud capability. (A recent survey by one public library sysop indicated that only approximately one-third of all callers had 1200 baud capability.[5]) Computers actually in use are Apple II+, IIe, Compaq, TRS-80 Model IV, IBM PC/XT, and Victor 9000. The most commonly used is the Apple II series.

Doing what's necessary

While some people will say that it is, a BBS operation is not easy. Even though the hardware and software may set up in relatively short time, the operation requires at least a moderate level of technical expertise. However, this can be mastered by most anyone willing to spend the time. The daily attention to details and problem solving probably take a much greater toll on sysops. One special library BBS offering professional networking in Canada, and a year of 24-hour-a-day service, reluctantly ceased operation in March 1983. The workload simply grew too

"...a BBS operation is not easy.... Most of the librarians operating a BBS have either considerable microcomputer training or there is someone on the staff who does"

"Efforts by some of the libraries to recruit BBS volunteers met with both good and bad results .... If there is a falling out with the volunteer, then all passwords must be changed...."

grea. for even their enthusiastic staff.[6]

The fact that any list of nonlibrary bulletin boards changes very rapidly because of failure or frustration also attests to this level of difficulty. Most of the librarians operating a BBS have either considerable microcomputer training or there is someone on the staff who does.

This type of operation also requires the whole-hearted support of the library administration. (One librarian said that they were told by the administration that they could run a BBS only "if it took no time and cost no money!") The maximum amount of staff time required that any library reported was one hour per day. All others reported four hours or less per week.

Many also reported that they initially needed more time, but that once the "bugs" had been straightened out, they required only 15 to 30 minutes per day. This seems to refer to maintenance time only, such as reading and responding to messages, printing out the logfile, and perhaps changing diskettes and making backups. If it is decided to include many different features and articles, or to answer reference questions, then it requires time to prepare them, solicit them, or to just type them in at the keyboard.

A recently funded proposal for a project in Illinois, "Lincolnet," allowed for a ten-hour-a-week typist/assistant position for the first year. This person was responsible for keying in all database entries, among other chores. Ten hours was determined by an examination of several other boards where a principle problem to the development of a large database (Lincolnet is slowly growing to fill up some ten megabytes) is staff time.[7]

Efforts by some of the libraries to recruit BBS volunteers met with both good and bad results. On the bright side, the "Flatlander" board (Odessa College, Texas) has two very reliable remote sysops. Also, volunteer help has even proved valuable to write the program for one library. On a more ominous note, however, the watchword was: "Hackers don't (or can't) keep secrets (i.e., passwords)."

A remote sysop—i.e., a person who performs routine maintenance of the system from their home—is not always a good arrangement. If there is a falling out with the volunteer, then all passwords must be changed. It is even conceivable that a volunteer could quite easily change the source code, giving them permanent and secret access even after being kicked off the system. One library, in fact, complained that a volunteer had built a number of such "back doors" into the system, and that it had caused enormous problems.

Mischief, security, sabotage

Though security problems can occur on any type of board whenever an outsider knows of the existence and telephone number of a computer system, usually public access boards will suffer the most. Mischief appears to be one of the thorniest issues facing library sysops. The one recent court case involved a privately owned board in Los Angeles. A user left another man's telephone credit card number on a BBS operated by Thomas G. Tcimpidis; Tcimpidis's home was entered by authorities and his equipment confiscated. He was then charged with "knowingly and willfully publishing" the credit card number. Lawyers and microcomputer owners came to his aid.

In February 1985, nine months later, the City Attorney's office dropped the case. According to *InfoWorld*, Reginald Dunn, chief of operations of the Criminal Division, stated that, "We didn't have sufficient evidence to establish all of the elements necessary to satisfy state law."[8] That is, they were unable to prove that Tcimpidis was knowingly allowing his BBS to be used for this purpose. Sysops everywhere now breathe a little easier, but such issues as censorship, libel, and responsibility are far from resolved.

At the moment, there is also a campaign by BBS users and sysops to fight potentially damaging federal legislation against such services.[9] Registration or other restrictions (e.g., keeping a log of all user names, messages and access times, the use of legal names, etc.) could deal a serious blow to a new medium in its formative stages. Just how much this might cripple library in-house or professional networking applications remains to be seen. Librarians should be aware: governmental red tape could make such operations not worth the effort.

The Instructional Media Center of one school reported that students using the BBS number, from their homes after school, would post graffiti, obscene messages, and computer access numbers for banks and Western Union. The solution was to take it down at the end of the school day, since its primary function was for use by media specialists.

Perhaps the most incredible story that surfaced was that the Secret Service had shown up promptly at a library to confiscate the diskettes after a caller left a message that implied some type of threat to Ronald Reagan. Since messages are public, not private, and do not involve circulation, they were turned over (apparently to be used as evidence) without the need for a court order. Bulletin board operation was not impeded since the Secret Service was only interested in evidence, not the operation of the board. Other problemsencountered by libraries included people leaving bogus ads (e.g., "I've got an Apple IIe with two disk drives, printer, and modem for only $795") with a fictitious telephone number.

Solutions?

Ways of dealing with such problems vary. For instance, with the People's Message System (PMS), it is possible to include forbidden words in an "obscenity" filter, a custom-made file which can include numbers, addresses, names, obscene words, or whatever. That makes it difficult but not impossible for credit card numbers to be posted. Even personal names, numbers, etc., may be put into the filter, but it is not possible to filter out everything that is questionable.

Another method, actively proposed by some nonlibrary sysops, is to require that everyone use a password, making their identity known. That is a difficult option for most public libraries for two reasons. First, if libraries are forced to validate everyone, the workload might well make the practice prohibitive. By tradition, the public library does not ask the identity of people coming in to use its services, unless they wish to check out books. Why should modem patrons be treated differently? Still, at least two public libraries do validate all users who want write access, with apparently good results. In effect, unless callers were pre-

Vendor Addresses

There are more boards available than are listed here. To examine menu printouts of some of those listed, consult Neil L. Shapiro, *The IBM PC Connection* (McGraw, 1983), or *The Computer Phone Book* (Plume: NAL, current edition) by Mike Cane.

ABBS, Software Sorcery, Inc., 7927 Jones Branch Dr., Suite 400, McLean, VA 22102. The total system costs $174.95 which includes conferencing, upload, download, privacy, and news modules. Some of the earlier versions of the ABBS were very poor at error handling, i.e., they crashed a lot. Apple II+.

A-C-C-E-S-S, Information Intelligence, Inc., Box 31098, Phoenix, AZ 85046. 800-228-9982. Apple. $250.

BBS-PC, Micro-Systems Software, Inc., 4301-18 Oak Circle, Boca Raton, FL 33431. IBM.

Cactus-800, Antonelli Enterprises, 200 Hillview Dr., Rochester, NY 14622. Atari.

Conference Tree, Communitree Group, 470 Castro St., Suite 207-3002, San Francisco, CA 94114. Apple II.

Connection 80, B.T. Enterprises, 171 Hawkins Rd., Centereach, NY 11720. TRS-80 (Model I).

Capital PC Remote Bulletin Board System, CAPCC Users Group, Box 3189, Gaithersburg, MD 20878. IBM PC. 300 or 1200 baud. $25.

Crosstalk, Microstuf, Inc., Box 33337, Decatur, GA 30033. A smart terminal program for CP/M systems.

Dataflex, Data Access Corporation, 4221 Ponce de Leon Blvd., Coral Gables, FL 33146. A comprehensive application software development system for CP/M systems; it also contains a powerful relational database management system.

Dial-Your-Match, Matchmaker Enterprises, Box 6055, Burbank, CA 191510. Strictly for online dating services, not the traditional type BBS operation (certainly not as practiced by libraries).

FIDO BBS, available from Tom Jennings, 2269 Market St., #118, San Francisco, CA 94114. May be purchased for $60 plus $25 for documentation and manuals, or downloaded through a Fido BBS. MS-DOS compatible micros.

GBBS Pro, Bulletin Board System Version 1.7, Micro Data Products, 537 Olathe St., Unit G, Aurora, CO 80011. Apple. 300/1200 baud. ProDOS or DOS (by request). 303-360-6200, voice. $125.

Hostcomm, N.F. Systems, Ltd., Box 76363, Atlanta, GA 30358. IBM PC. $170.

Message-80, Microperipheral Corporation, Box 529, Mercer Island, WA 98040. TRS-80 Models I and III.

Micro-Com BBS, Box 24343, Houston, TX 77229. Apple. $59.95.

Mouse Exchange, Dreams of the Phoenix, Box 10273, Jacksonville, FL 32247. Macintosh. $39.95.

Net-Works II, High Technology Software Products, Inc., Box 60406, 1611 NW 23rd St., Oklahoma City, OK 73146. This system will assign each user a convenience password automatically at logon. Apple.

People's Message System (PMS), available from Bill Blue, Marilla Corp., 1274 Vista Del Monte Dr., El Cajo, CA 92020. Apple. 300 baud only. $300.

Plantz RBBS, Box 95738, Hoffman Estates, IL 60195. IBM PC. 300/1200/2400 baud.

TBBS, The Bread Board System, Aesop, Inc., 4122 S. Parker, Aurora, CA 80014. A very friendly system which supports a host of functions. For the most part, it requires only the touch of one letter to execute a command. It supports MDDOS, CP/M, and TRS-DOS. $299.

Towne Crier, Saturday Software, Box 404, 2813 Louisa St., Catlettsburg, KY 41129.

Trade 80 BBS, Joe Agrella, 1226 NW Fourth Ave., Fort Lauderdale, FL 33311. TRS-80 (separate versions for Model I, II, or III). $149.99.

pared to identify themselves, they only had access to a read-only board. Another variation on this theme is that of the "Flatlander" bulletin board system which has a delayed password validation system.

In this same vein, the ultimate solution is to simply make a board read-only, allowing no one to post messages, at least in the case of public access. Even though the Tcimpidis case was resolved without serious legal damage to the BBS service, there are still many issues unresolved, and the whole incident has had a chilling effect upon BBS operation. It is not inconceivable that the read-only board could become the standard.

Sabotage was also a complaint and is faced by all boards everywhere. For whatever reason, people with autodialers can call up and in effect "tie-up" a BBS all night. Reports tend to suggest that these people tire of these pranks in a few days (as they tie-up their own equipment at the same time), but it is still the equivalent of someone blocking the entrance of the library until they decide to get up to go home.

One library reported that this occurred as retaliation when someone abusing the BBS (profanity, etc.) had been permanently kicked off. This type of system crashing, typically seen as simply "sport" by those who engage in it, is frequently written about in the literature, and is dreaded by sysops everywhere.[10]

There is no doubt that "crashers" can indeed do a lot of damage to a system. Most, if not all, of the damage will be restricted to the destruction of data files, which is usually not a major crisis on a five-inch floppy-based system. On a hard disk, however, it can mean that the system has been "initialized" and the sysop must reload all of the files, assuming that they were backed up in the first place, a lengthy procedure itself. At least a partial solution is to institute proper security procedures.

These include not using an obvious password for either the master passwords or individual passwords (e.g., don't use a system for creating passwords which allows them to be guessed), making certain that the disks and all other data is backed up regularly, and never engaging in any type of conversation with "crashers" through E-mail or otherwise, since this only serves to encourage them. If you know a BBS hacker or enthusiast, ask them to "attack" your board and to let you know its weak points and then correct them. But both passwords and telephone numbers of both public access or private boards can be compromised, especially if there is a large body of users.

Pirates and hackers notwithstanding, systems tend to crash for three reasons: software (bad error handling, e.g., poor carrier detection); hardware failure (overheating, disk drive failure, etc.); or disk failure. Disks fail unexpectedly and create problems when backups are not made on a regular basis. Backup procedures vary from daily, weekly, and monthly, and from one set of backups to as many as six.

Censorship concerns

Several libraries mentioned concerns over censorship. How far should patrons be permitted in their discussion? Those librarians who ventured an opinion or policy attempted to censor nothing that did not appear either illegal or in extremely bad taste. Short of the PMS and its obscenity filter, or validation of each user, no one had any real answer for sexually explicit material, other than just removing it. In fact, no one reported it to be more than an occasional nuisance. Two libraries have fashioned censorship policy statements to display on their BBS.

As devastating as some of these problems might appear, they all occurred on an infrequent basis, and a BBS may go for months or years with no significant problems with hackers or crashers. On the other hand, it has been observed by one sysop that 95 percent of all such problems cease on a public access board by simply removing the message section or write-to database. Unfortunately, such actions also remove much of the intrigue and interest of a bulletin board which is communication with other human beings by the posting of messages. Certainly, no one felt that any of these problems outweighed the benefits of the BBS.

What do the boards offer?

While a wealth of variety in purpose and function was reported, it is likely that only the surface has been scratched. The important point for anyone starting up is not to feel constrained by what others are doing, but to think up new and different applications. The local community may offer something special or unique. These are the BBS functions being carried out or planned by libraries. Liverpool Public Library BBS, managed by Jeanne Polly, wins out as the

"How far should patrons be permitted in their discussion? . . . librarians . . . attempted to censor nothing that did not appear either illegal or in extremely bad taste . . . . no one had any real answer for sexually explicit material other than just removing it"

Other Sources of Information

Burke, Barbara & Linda McNamara, "Electronic Bulletin Boards: an Annotated Bibliography, Part 1," *Small Computers in Libraries*, June 1985, p. 17.

Burke, Barbara & Linda McNamara, "Electronic Bulletin Boards: an Annotated Bibliography, Part 2," *Small Computers in Libraries*, July/August 1985, p. 20.

Cane, Mike. *Computer Phone Book*. Plume: NAL, annual, $9.95.

Dewey, Patrick. *Essential Guide to Bulletin Boards* (Meckler Pub.). Describes and reviews dozens of software packages as well as offers in-depth help in starting up a bulletin board operation and solving problems.

Landreth, Bill. *Out of the Inner Circle: a Hacker's Guide to Computer Security*. MicroSoft Pr., 1985, $9.95.

"Libraries Extend Their Reach with Bulletin Board Systems," *Bulletin Board Systems*, June 1985, p. 2.

Meyers, Larry. *How To Create Your Own Computer Bulletin Board*. TAB, 1983, $12.50.

Tucker, Tom & Tom Beeston. *Hooking In: the Underground Computer Bulletin Board Workbook and Guide*. Kampmann & Co., 1984, $12.95.

Wilburn, Gene & Marion Wilburn, "Microcomputer-Based Bulletin Board System: Free Videotext and Electronic Message Services," in *Microcomputers for Libraries: How Useful Are They?*, ed. by Jane Beaumont & Donald Kuger. Canadian Library Assn., 1983.

The only newsletter devoted to bulletin board systems is entitled, appropriately, *Bulletin Board Systems* (formerly *Plumb*), $26.50 subs. from Meckler Pub.

most creative endeavor, but all librarians showed new and different ideas.

Interlibrary loan

References to interlibrary loan are scarce, though at least three have been reported in the literature. In November 1982, Flower Hund of Ward Edwards Library reported that the Kansas City Metropolitan Network used electronic mail on an Apple to expedite interlibrary loans.[11]

Kathleen Gosz, system director of the Waukesha County Federated Library System, reported in December 1982 that an Apple with a 300 baud modem, dot matrix printer, and 48K RAM would be used to set up an interlibrary loan network.[12]

Sally Drew, director, Wisconsin Reference and Loan Library, began the operation of an IBM PC with five-inch disk drives (a hard disk drive to be added later) for interlibrary loan on June 1, 1985.

One interesting note of The MAIL Project in Pennsylvania (a microcomputer communications system) is that "One important proviso of the system is that it is not intended to replace existing interlibrary loan networks already in place."

Publicity and statistics

Some libraries operating a public access BBS generate publicity through other local, nonlibrary BBS services by calling them with a modem and posting notices, and asking to be included in the regular list, etc., and at least one has been included in books and other publications about the BBS (this is decidedly for a longer-term project). Some include word of the library board on library-printed materials or on a special flyer or a bookmark with instructions.

Some interesting statistics and records were reported by libraries as being available that revealed a great deal about the patrons who called and how the service could be expanded (or if it should be). These include: log-file (name/address/phone number), number of callers (on a daily basis), time spent on the system, how many times each message had been read, a comment file, and the number of messages left on the system. The North-Pulaski Library has now reported over 27,000 callers in approximately four years, with over 7000 messages. In addition, it is possible—just as in the traditional library setting—to survey patrons on services, materials, etc. (some BBS software allows for an online survey to be conducted).

Who calls the board?

It is difficult to characterize the patron base of the public access BBS, but reports indicate that people of all ages are represented. A look at a log-file suggests that the average caller is a male who spends approximately 15 to 20 minutes per visit. That also seems to have changed over the past two years; many more women are now calling. Obviously, many of the callers are computer buffs, but more people who are less interested in computers than in its benefits have also begun to call.

Callers more and more are reflecting a cross-section of people who normally visit libraries. Judging from the comments which have been collected by some libraries, the computer public believes that online services are not only an appropriate activity for a library, but necessary if their library is going to keep pace with the 20th Century.

The glory, the education, the fun

The actual benefit derived from such an effort seems harder to put into words, but there is a variety of answers, including good public relations, computer education for the staff and public, and a free way to demonstrate and learn about telecommunications.

The greatest problem facing anyone wishing to operate a BBS is finding reliable software. Nearly everyone answering the survey reported some problems ironing out bugs, crashes, poor documentation, etc. Just calling a BBS and examining the menus and features does not tell anyone how hard it will be to operate. Though dozens of BBS programs have been written, they are difficult to locate, and few of them have been reviewed anywhere by anyone. Clearly, more BBS software review and evaluation is needed.

Despite its many problems, the BBS can play an important part in generating good public relations and information about libraries; it "fits in" with the current rage. How long that will last is anybody's guess. It was also fun to see first-hand the enthusiasm and creativity of a wonderful group of pioneering librarians, and to logon to most of their systems, which was without doubt the most fun I've had in quite some time.

References

1. PLA Task Force on the Use of Microcomputers in Public Libraries, July 8, 1985, 2-4 p.m., ALA Annual Conference, 1985, July 6-10, Chicago. Tape of this program is available for $18 through Eastern Audio Assocs., Inc., 6330 Howard Lane, Elkridge, MD 21227; 301-796-0040.
2. For the full account of "MAGGIE's Place," the computer network of the Pike's Peak Library District, see Kenneth E. Dowlin, *The Electronic Library*, Neal-Schuman, 1984.
3. Christensen, Ward & Randy Seuss, "Hobbyist Computerized Bulletin Board," *Byte*, November 1978, p. 150.
4. "Librarian's Bulletin-Board System," *Small Computers in Libraries*, October 1982, p. 5. News of this board's demise came from a telephone call I made to get additional details.
5. Survey conducted by Marvin Garber of users of the North-Pulaski Library BBS during the first part of 1985.
6. Infoport, a BBS operated by Gene and Marion Wilburn in Ontario, Canada apparently ceased operation in 1983.
7. For additional information about this project, write or call me at the Maywood PL, 121 S. Fifth Ave., Maywood, IL 60153; 312-343-1847.
8. See *InfoWorld*, February 25, 1985, p. 19.
9. Information from a message being circulated on bulletin boards entitled "Federal Legislation Restricting BBS Operation Due Soon!" July 1985.
10. An interesting account of hacker and crasher activity is found in *Out of the Inner Circle* (MicroSoft, 1985) by Bill Landreth, a former hacker "apprehended by the FBI" (according to the cover) and put on probation for three years, during which time he must "finish high school." While the book is of interest as background material to what makes hackers tick, it really gives little insight into how to stop this type of activity, despite some effort in this direction.
    The best account of how the "hacker" came to be is in Steven Levy's *Hackers: Heros of the Computer Revolution* (Doubleday, 1984). Anyone interested in personal computers will find the book impossible to put down. Many of the things we have all experienced have their origins explained (e.g., adventure games, arcade games, programming, etc.).
11. Hund, Flower. *Small Computers in Libraries*, November 1982, p. 1.
12. Gosz, Kathleen, *Small Computers in Libraries*, December 1982, p. 1.

Electronic Bulletin Boards . . .

. . . in Service

Here is a listing of those libraries with a BBS. Also included (separately) are libraries with future plans for a BBS. Only included are those libraries whose plans seemed far enough advanced or thoroughly thought out to be useful. These listings should be seen as a "snapshot" of activity at the time of the survey, since systems continue to be updated, or come and go.

Faulkner-Van Buren Regional Library (Conway, Ariz.) has operated a Fido BBS since October 1984. Prior to that it operated an RBBS but abandoned it in favor of the new software because of poor security. The system operates evenings, Saturday, and Sunday. Hardware includes an IBM PC with a 20-megabyte Bernoulli Box. Since the system is used for administrative work during the day, changing cartridges in the fixed disk converts the whole system into a BBS conveniently and quickly. Fido also provides various levels of security. Maintenance time takes about 15 minutes per day. The public has access to various subboards for various types of micros, which includes public domain software.

Illinois State Library has been operating the Online Network of Continuing Education (ONCE) since June 1984, and is funded in part by an LSCA grant. The CP/M system software is called *Dataflex*, and operates with the communications software package *Crosstalk 15XVI*. The computer used is a Victor 9000 with hard disk. Modem type is US Robotics Autodial 212A. This is the only BBS which has a toll-free number, though it was reported that this line costs between $800 and $1000 per month. Callers have access to an online manual which describes the system and how to use it, and contains a list of search topics. The database of workshops, classes, and related news may be searched by geographical area as well. Information available includes time, place, sponsor, speakers, audience, contact, credit, fees, accommodations, phone, comments, deadline, etc. (See Reference 1.)

Liverpool Public Library (New York) has had an energetic, multifaceted public access microcomputer program since 1981. Their PMS went online in January 1985, but as of mid-year, it was receiving about 1000 calls per month. Hardware in use: Apple IIe with extended 80-column card, Mountain Hardware Clock, Grappler plus printer interface, Hayes Micromodem II 300 baud modem, and three five-inch drives. They report no down time, no real problems with the program, but had to call the vendor three times for assistance to set up. They also report that the staff had a lot of fun writing the file for the obscenity filter. The system is under the direction of Jean Armour Polly, assistant director of public services, who has one full-time and one part-time microcomputer assistant. The system is up whenever the library is closed. Initial services offered: messages, chat, public domain software, and an advice column, "Ask Aunt Libby," has been popular. (See Reference 1.)

Loma Linda University Medical Center Library (Calif.) has been operating an excellent TBBS since December 1983 for the exclusive use of the university. To date, over 1000 calls have been received, at a current rate of 50 to 250 calls per month. Services provided include conferencing (E-Mail special interest discussions), public domain software downloads, reference, chat (paging) with librarian (if available), *Medline* requests, private memos, and a computer-oriented newsletter. The BBS is very much seen as an extension of the library and the format suggests a "visit to the library," and callers "exit the library" to signoff. First-time users get three minutes to complete the "library card" and then can call back for more time at a later date. Equipment used: Compaq with two disk drives, AST Board, 320K memory, on-board clock, Smartmodem 1200B, Toshiba P1351 printer. The system is available to users 24 hours each day and is considered another "employee." (Kittle, Paul W., "Putting the Medical Library Online: Electronic Bulletin Boards . . . and Beyond," *Online*, May 1985, p. 25.)

Montgomery County School System (Rockville, Md.), Department of Instructional Resources (Ellen C. Pruitt, teacher specialist), operates an Apple Bulletin Board System (ABBS 4.2.1, a later version than that used by the North-Pulaski Library noted below) for use by its media specialists. It began operation in May 1983, and consists of an Apple II+ with two five-inch drives, a 300 baud Hayes Micromodem II, RAM card, and Mountain Hardware Clock. It was reported that the clock was knocked out this past summer by a power surge. The system supports conferencing, downloading of public domain software, uploading, news modules, privacy, and autolog. They have also prepared one of the best brochures around. It contains general information and some of the more important commands to aid first-time users.

A policy that is communicated through their brochure reads: "This CBBS was designed to serve as a medium of news and information exchange among schools. It shall not be the source of policy formulation. Its users are reminded that they are expected to respect an individual's right to privacy and to avoid infringing on copyright laws regarding microcomputer software."

Mountain-Valley Library System (Sacramento, Calif.) has been operating a BBS for member libraries (not open to the public) since September 1983. Hardware involved is a TRS 80 Model IV with floppy disk drives, and a 300 baud Hayes modem. They have two of these systems and they can be used to back each other up. Interlibary loan is one example of how it is used. It is part of the system's "Communications and Delivery Program," and therefore only available during regular work hours. Its major function is communication, so its only feature is messages.

North-Pulaski Personal Computer Center (Chicago) has had a BBS in operation

since 1981. The equipment consists of an Apple II+, two disk drives, an Epson MX-70 printer, a green-screen BMC monitor, and a DC Hayes 300 baud modem. Two types of software are used: *Apple Bulletin Board System* (ABBS 4.0), and, more recently, *People's Message System* (PMS). The ABBS was very difficult to operate and had all sorts of problems, including too much maintenance and too many crashes. (See Dewey, Patrick, "The Electronic Bulletin Board Arrives at the Public Library: the North-Pulaski Prototype," *Library Hi Tech*, Spring 1984, p. 13.)

The original concept was to make a library-based electronic magazine for callers, including book and movie reviews, etc. At least two children's librarians have been involved with the production of puzzles, book and movie reviews for the kids. Permission was sought and obtained to publish computer book reviews from *Booklist*, as well as articles on consumerism from other journals and newsletters. Three freelance columnists provide restaurant reviews, a pet health column, and soap opera news. Calls to the system number almost 25,000, and over 6000 messages have been left. Callers have included at least one blind patron who uses a speech synthesizer. Courtesy logon codes are given to anyone who wants one. (See Dewey, Patrick, "Dear ABBS: Maintenance, Management, and Problems," *Small Computers in Libraries*, April 1982, p. 1.) North-Pulaski has also recently received a new grant from the Friends of Chicago Public Library for $2,351.50 to enhance this program by making the BBS a 24-hour board on a ten-megabyte hard disk drive (Apple Sider).

Odessa College Learning Resources Center (Texas) has operated a public access board, "Flatlander," since September 1, 1982, using an Apple IIe with a ten-megabyte Apple Sider hard disk drive (originally only 5¼-inch drives were used), 300 baud Hayes Micromodem II. Software in use is *Net-Works II* to which extensive modifications have been made. Sysop David Carson reports that there have been some minor obscenity problems, but the board is monitored regularly, and a word filter is planned. Nearly 10,000 calls and over 2000 messages have been left by the public to this board.

One motive for the establishment of this BBS was to provide an alternative to such services as the Source which are expensive for patrons to call. Features are numerous, including E-mail, public domain software for nine different micros, lists of local BBS numbers, adventure tips, and more. The system only allows first-time users ten minutes. Once their password has been validated they then have access to the entire board and not just limited areas.

Online Database Information Network (ODIN) is operated by a group of eight libraries, including academic, public, school, and special in four counties near Harrisburg, Pennsylvania, and funded through LSCA-III funds. The decentralized system is maintained on eight computers; each library has dial-up access to the others. Information maintained at separate sites includes several databases. One is a full-text, local history database and is drawn from local newspapers, church, cemetery, and court records. Another database is a "Speakers/program file" which provides access to speakers in the four-county area. Software used is called *Small DB*, and is run on eight TRS-80s. (See Townley, Charles T., "ODIN: a Multifunction, Multitype Library Microcomputer Network," *Information Technology and Libraries*, June 1984, p. 175.)

Palinet and the **Pittsburgh Regional Library Center** have received LSCA funding for a 24-hour-a-day/seven-days-per-week micro-based mail system which links 105 libraries together using a Columbia 1600-4, hard disk drive, US Robotics 212A modem. It is also the second system discovered which has an "800" telephone number available for callers. Software was custom designed, and changes, fixes, or upgrades are done by the programmer. The package will handle up to four callers simultaneously.

How is this communications system used? "Drafts of grant proposals and other documents worked on jointly are sent back and forth for revision before being sent to the State Library, meeting announcements and agendas are distributed throughout the state, want ads on the bulletin board have included card catalogs for sale and job announcements, the State Library distributes up-to-the-minute reports on state and federal legislative actions pertinent to libraries, and requests for information of all sorts are distributed more widely than is feasible with regular postal services . . . ." (In addition to the return of the survey, I was sent a manuscript copy of "Pennsylvania's Electronic Mail Network," by Anne S. Hudson, scheduled to appear in *Interface*, an ALA-ALSCA newsletter.)

San Bernardino Public Library (Calif.) has had a BBS in business since December 1983, and it is a spectacular system. Hardware includes an Apple II+, Amdex Color monitor (40 column), two Apple disk drives, one ten-megabyte Corvus hard disk drive, Hayes Micromodem II. The software has been custom programmed. Callers are given access to many different features, including an ambitious effort at online reference.

Other features include a listing of free databases and an impressive list of public domain software. An interesting feature is the user list, which may be examined by any caller and includes name, city/sate, and type of hardware used by the caller. When I logged on there were 183 users listed. (See "Home Micro Users Swamp San Bernadino PL," *Library Hotline*, June 17, 1985, p. 6, and Lambson, Norman, "Microlink Electronic Bulletin Board at San Bernadino Public Library," *Apple Library Users Group Newsletter*, September 1984.)

Spokane Public Library (Washington) began operating a BBS on January 13, 1984. Hardware is IBM PC with five-inch disk drives, Hayes 1200 baud Smartmodem. Software is Capital PC's *Remote Bulletin Board System*. They report no major problems with either. Services offered (from their bookmark-size flyer): "library hours and locations, notices of free library programs, and reviews of new computer books. It also lists local computer groups, announcements of meetings and workshops, and other bulletin boards." Also included is reference (experimental). Approximately 200 calls are received each month. It is also seen as a way to help train staff in the use of microcomputers.

Suburban Library System (Burr Ridge, Ill.), in cooperation with the **Maywood Public Library** (Ill.), has succeeded in acquiring an LSCA grant for $10,450 in funding to purchase a ten-megabyte hard disk Apple IIe public access PMS to publicize library programs for all libraries in SLS. The grant calls for a ten-hour-per-week typist/assistant for data entry. The project began in early 1986, and will eventually house a virtual course for callers on how to get the most from their library, library legislation, book reviews, and much more. The system will be in operation 24 hours each day. Though PMS was the originally installed software, by mid-1986 new GBBS software was installed. This allowed the addition of 1200 baud operation, great flexibility in remote sysop functions, and automatic assigning of passwords (which are merely verified by the library staff each morning).

Waukegan Public Library (Ill.), in exchange for running a BBS, has provided a test site for MicroLab, a software vendor (Highland Park, Ill.), bulletin boards since November 1983. Software which has been tested includes *Modemedium* and, currently, the *Lock Ness* BBS. Equipment in use is an Apple II+, Novation Apple-Cat II (300/1200 baud), RAM card, Thunderclock, Videx 80-column card, and Z-80 softcard. The system is serviced completely by a volunteer professional programmer. A number of hardware complaints were registered, including that the Motherboard, the power switch on the power supply, and system saver fan had to replaced, and that the modem does not operate properly.

Wisconsin Reference and Loan Library (Sally Drew, director) has been operating an electronic bulletin board for interlibrary loan purposes since June 1, 1985, on an IBM PC with five-inch disk drives, a Hayes Smartmodem, using a data-conditioned dedicated centrex line. Software employed is RBBS, which is available free from local user groups. A hard disk will eventually go online to upgrade the system. The BBS is a closed system, requiring permission by the operators. Librarians use it to report interlibrary loan requests. The project at this writing is still in the testing stage, so it should be interesting to see how the program is running in a year or so.

. . . to Come

California State Library plans several bulletin boards, including one LSCA-funded micro-literacy project and another for a California Library Association Library Automation Committee Project on who's doing what in automation.

Groton Public Library (Conn.) is planning a system and has acquired an Apple IIe with an eye toward a Corvus hard disk system.

Louisville Free Public Library (Ky.) will begin operation of a new BBS in the very near future. Its ten-megabyte hard disk drive will make it the largest BBS in the Louisville area. The system hardware consists of a DEC Rainbow linked to a multitech modem and will operate at 300/1300 baud. The software used is called *Fidonet* (MS-DOS version 2.11). Planned for inclusion are the following: ongoing public information columns, monthly new book lists, words for the day, quotation file, crossword puzzles, etc. The system will operate from 5 p.m. to 8:30 a.m. Friday-Monday; this is the familiar off-hour schedule adopted by other libraries. Louisville has added Apple and Commodore micros to all of its 22 branch libraries.

The Museum of Science and Industry Library (Chicago) is planning a microcomputer BBS using either an IBM PC or an Apple IIe. Included will be a calendar of events for the museum, schedule of seasonal classes, exhibit schedules, and it will provide a medium of discussion for the Science Club.

Rosary College (River Forest, Ill.), Department of Library and Information Science, plans a PMS for use as a read-only placement service for students.

West Virginia College of Graduate Studies, Library Services (Institute) is planning a bulletin board using an IBM XT and a Hayes Smartmodem 1200. Over half of their 2000 students attend classes at remote sites, so a BBS is seen as a way to increase communication between students, students and faculty, or faculty and the library. Software used will be RBDS, a public domain system (source not specified). The system is expected to operate off-hours (all but 8 a.m. to 5 p.m. Monday-Friday).

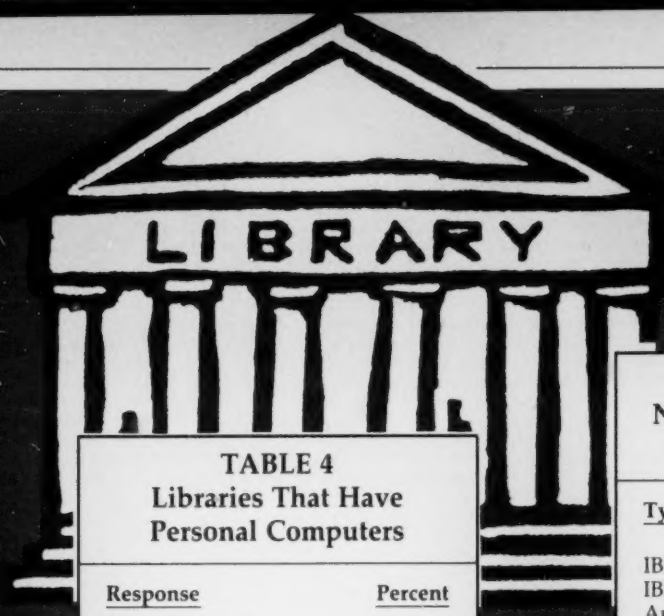

TABLE 4
Libraries That Have Personal Computers

Response	Percent
Library has PC	
Yes	79.9
No	20.1
Type of PC	
IBM	60.6
IBM Compatible	24.4
Apple	56.6
Other	30.1

Source: Cahners Research, September 1986

TABLE 5
No. and Type of Personal Computers in Libraries

Type of PC	Mean No.
IBM	3.08
IBM Compatible	2.85
Apple	3.28
Others	2.31
Average Memory	285.8K

Source: Cahners Research, September 1986

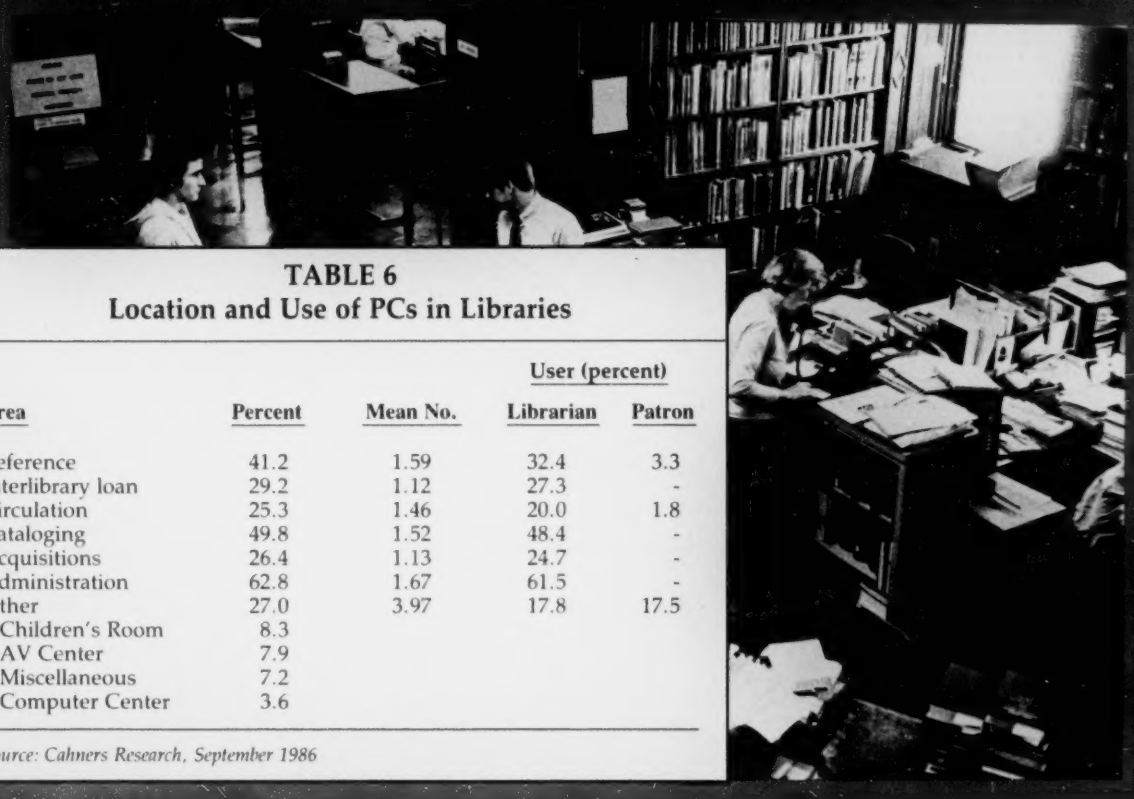

TABLE 6
Location and Use of PCs in Libraries

			User (percent)	
Area	Percent	Mean No.	Librarian	Patron
Reference	41.2	1.59	32.4	3.3
Interlibrary loan	29.2	1.12	27.3	-
Circulation	25.3	1.46	20.0	1.8
Cataloging	49.8	1.52	48.4	-
Acquisitions	26.4	1.13	24.7	-
Administration	62.8	1.67	61.5	-
Other	27.0	3.97	17.8	17.5
Children's Room	8.3			
AV Center	7.9			
Miscellaneous	7.2			
Computer Center	3.6			

Source: Cahners Research, September 1986

Online Integrated Automation of the Metropolitan Library System

By Paul F. Little & Jimmy C. Welch

ON JULY 1, 1985 the Metropolitan Library System, serving Oklahoma County and City, brought up its online, integrated system of automation as custom designed by library staff. The first and second days of operation revealed a few minor adjustments that were needed in two subsystems. These were software problems that were quickly adjusted by the designer of the system, the chief of automation and technical services for the library system. The July 1st event activated these major computer subsystems: bibliographic database (including OCLC interface); circulation; patron reserves for materials; online catalog for library staff use; borrower registration; materials selection and acquisition. Many routines were included in these major subsystems.

Accounts payable, purchasing, and word processing had previously been installed between July 1, 1984 and June 30, 1986. Electronic mail, payroll, and personnel records have since been added. Booking of meeting rooms and 16mm films are scheduled to be installed within 12 months after July 1, 1986.

A prototype online public catalog is now developed. It will be tested at one or more pilot library sites beginning in the fall of 1986. Use of the online catalog will be evaluated from both the users and staff points of view. Evaluation of the current usage of the microfilm catalog that is updated every three months will be used as the control factor for evaluation of the online catalog. If the prototype that emerges from testing and evaluation proves to be a viable alternative, then its implementation will likely occur between July 1, 1987 and June 30, 1988.

"The recommendation of the study was that the library system should seek to replace its current batch system with an online integrated system that would be owned by the library . . . . this alternative would ultimately provide more benefits to the community"

The system is based on hardware from Tandem Computers Incorporated of Cupertino, California. Early in 1984 the library purchased and installed three Tandem NonStop II model processors with peripherals. In early 1985, the original processors were upgraded to the capabilities of Tandem's new TXP model, which is considerably faster. Some major reasons for the selection of Tandem equipment were: local sales and service; experience with libraries; nonstop capability without requiring purchasing of redundant hardware; expandability in small increments without experiencing large hardware obsolescence; relational files configuration; price.

The library system currently has 1.25 gigabytes of mirrored disc storage in its Tandem system. There are presently 202 terminal devices distributed throughout the 11 full-service agencies of the library system. These agencies are connected to the mainframe computer in a point-to-point, synchronous communications network at 9600 baud. The 11 remote service sites are as close as three miles and as distant as 21 miles from the central processor. All hardware is Tandem. The central processor operating systems, word processing, and electronic mail software are also Tandem products. The remaining software systems that are already installed, or planned for installations, are totally developed by the data processing staff of the library system.

The library system has enjoyed good support at both the system analyst and maintenance levels from Tandem. In 22 months of operation there have only been two instances of computer down time, and neither have been computer failures. One instance was a one-hour power failure at the building housing the computer, and another was for several days required to remove asbestos from the building. The library has been a "beta" test site for some Tandem products such as word processing and some equipment configurations. The word processing test was placed at the library by Tandem to make it available earlier than would have otherwise been possible.

Involvement of library staff in designing and testing the various subsystems is a vital part of the project. User groups were formed from persons who would be using the subsystems and they assisted in designing and testing the software programs. This practice is still being followed

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with current programs in development. The user groups have helped solve problems during the design stages, have made certain that system instructions and sequences were logical to users, and have helped to avoid major problems after a subsystem becomes operable.

Staff training is necessarily an integral part of the automation system and planning for its implementation. It was recognized early that a large number of library staff who had no previous experience or exposure to computers would be required to operate computer terminals and other peripherals. The first step taken was to arrange with a local college for a computer literacy workshop for any staff who needed an initial, basic explanation and hands-on experience with computers so that they felt more comfortable about the pending automation.

A written tutorial was developed for the two subsystems that 150 or so staff members would have to learn to use. A duplicate of the actual subsystem was installed in a protected part of the computer so that learners could practice using the subsystem without running the risk of costly errors that possibly occurred if the actual database records had been used for practice. Special materials for their practice were provided, such as barcoded records for library cards and books.

The persons who have served on user group committees to design and test subsystems are also serving in the role of tutors in training other staff members to use those subsystems. The library system established a dedicated staff training room early in 1985 and equipped it with terminals and other computer peripherals so that training could be held in an adequate learning environment, away from interference involved with actual job sites.

The custom programming accomplished to date has been done in approximately 25 months lapsed time, mostly by one staff member of the library data processing unit who did this work as well as carry out other regular duties. It is most difficult to translate this accomplishment into terms of how much time it would take to do the same programming in another organizational situation by other persons. The programmer involved was also the developer of the old batch system, has over 15 years experience in building large computerized operations, and over the years has developed extensive knowledge of the intricacies of public libraries. One Tandem expert recently commented that her best guess was that it would have taken two to four experienced programmers about three years, working full-time, to achieve the same work.

To a large extent the subsystems that were activated on July 1, 1985 were ones that had been in use by the library system in a batch mode since 1974. The system designer rewrote and converted them for the Tandem online environment rather than IBM and batch modes. The original system utilized NCR 275 "smart" terminals at the library units for data capture on magnetic and printed tape. The mgnetic tape was then converted for batch, centralized processing on an IBM mainframe computer located at and owned by the Oklahoma County government. The library utilized the computer on off-peak hours in a time-sharing arrangement of varying costs over the years it existed, including no charge in the three years or so preceding 1985.

In a study we completed for the library system in 1982, it was shown that the size of the library's automated activities was steadily approaching the point that would require significant investment in hardware in the county situation to even continue. Hosting the library activities was placing a strain on the facilities of the county processing unit. The recommendation of the study was that the library system should seek to replace its current batch system with an online, integrated system that would be owned by the library. It was shown that this alternative would ultimately provide more benefits to the community than an attempt to pursue the batch system further.

Library staff determined that there were a number of potential benefits to the library system if it was possible to purchase a viable hardware and software package from a turnkey vendor that would meet the needs of the library system. The needs were established by the staff and included in a Request for Information.

A comprehensive technical Request for Information was sent to all potential vendors of turnkey systems who could be identified on March 15, 1983. The request specified an integrated, online system and provided adequate information for an experienced vendor to adequately project the hardware size of the system required. The sizing information included organizational, community descriptions as well as projected average and peak transaction loads and expected minimal response times from the computer. The RFI listed and described these major subsystems that vendors should provide:

"the MLC expressed their faith in the competency of the library staff and also exhibited their concern for continuing to improve library service to the community"

1. Online Catalog (how to query, record formats)
2. Online Circulation and Bibliographic Inventory Control (Patron Files and Booking AV Materials included)
3. Serials Control
4. Materials Selection/Acquisition
5. Word Processing
6. Electronic Mail
7. Personnel Managment (payroll)
8. Financial Management (general ledger, accounts payable)
9. Fixed Assets Management
10. Research and Planning
11. System Back-Up; normal, emergency recovery procedures.

Another major requirement contained in the information requested of turnkey vendors was that hardware and software that they proposed should either be compatible with existing machine-readable files and instruments or the firm should state details and costs of any conversions

that would be necessary. This stipulation included barcoded borrowers cards and inventoried books and other materials and a MARC-formatted bibliographic database.

Seven responses were received to the Request for Information. Library staff analyses of these returns found that there were two major groups among those who answered the request. One groups was able to provide the business-type functions with existing hardware and software and the other was able to provide the library-type but not the business-type functions. There were large variations among these responses. None of them offered the complete range of services in either of the two major areas that were described in the proposal. The costs varied, for different levels of service, by more than 100 percent from the lowest to highest estimate for providing the services requested.

There were no vendors able to fulfill all of the software requirements, and at least one could not meet all hardware requirements. Many vendors listed software as "not available" and some stated that they had packages "under development." It was also obvious that at least one vendor that specializes in library turnkey packages had not specified nearly enough computer memory and data storage capacity for even the beginning phase of the proposal specifications. Some of the vendors proposed that they be allowed to use third party software as a subsystem solution. Several vendors indicated their resistance to the library system or other parties modifying the vendor software; some stated that it would not be allowed under any circumstances, others commented that such modification would negate vendor software support and warranties. Most of them stated that the vendor would be willing to make requested modifications, at what the library thought were relatively expensive costs to the purchaser.

Some vendors additionally objected to the possibility of the library running any third party software on purchased equipment if the software had not been supplied by the vendor. Their logic was that such software might degrade the required guaranteed response time, which would make it necessary for the vendor to void the guarantee.

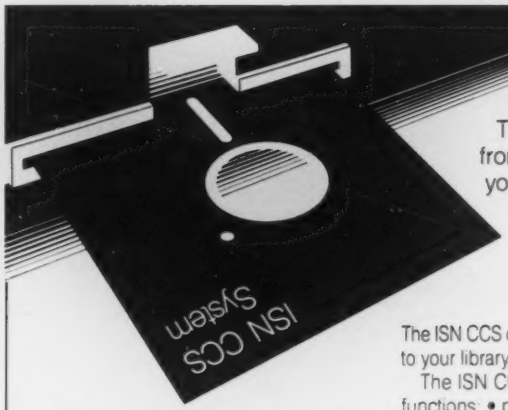
Not one of the responding vendors provided a definitive response to the question of compatibility of proposed software and hardware with machine-readable files and input barcodes currently in use at the library system. They did not assert definitive compatibility or deny it. Neither did they provide any useful conversion information if there was not compatibility.

The library system was faced with some basic possibilities at this point. If they were willing to relinquish the benefits of an integrated system, then they could purchase two or more turnkey packages and obtain most specific subsystems; however, the costs for this would have been almost overwhelming. A more viable route could have been the purchase of one turnkey system and development of other subsystems by library staff; again, the costs would have been higher than had been hoped and the benefits of integration would be lost.

The members of the Metropolitan Library Commission accepted the recommendation of library staff that the integrated system be developed by the staff. In so doing, the MLC expressed their faith in the competency of the library staff and also exhibited their concern for continuing to improve library service to the community.

As a result of the commission approval, the library system issued a Request for Proposals September 2, 1983, to all known to maintain permanent sales and services in Oklahoma City/County. The final results of this series of actions led to purchase and installation of the Tandem computer equipment and ultimately the integrated, online system that is now operating smoothly.

The Tandem system purchased represents approximately 1.3 million dollars invested. This compares with the lowest bid that was received from all other vendors. Yet the lowest bid did not include communications hardware; the hardware configuration was undersized for even beginning full-scale library operations and lacked the ability to fulfill some other requirements as well. Conversion of 700,000 data files and 300,000 barcoded plastic patron cards also was not included. The lowest bidder did not offer the nonstop feature of Tandem that has been responsible for zero computer down time in 22 straight months of operation.



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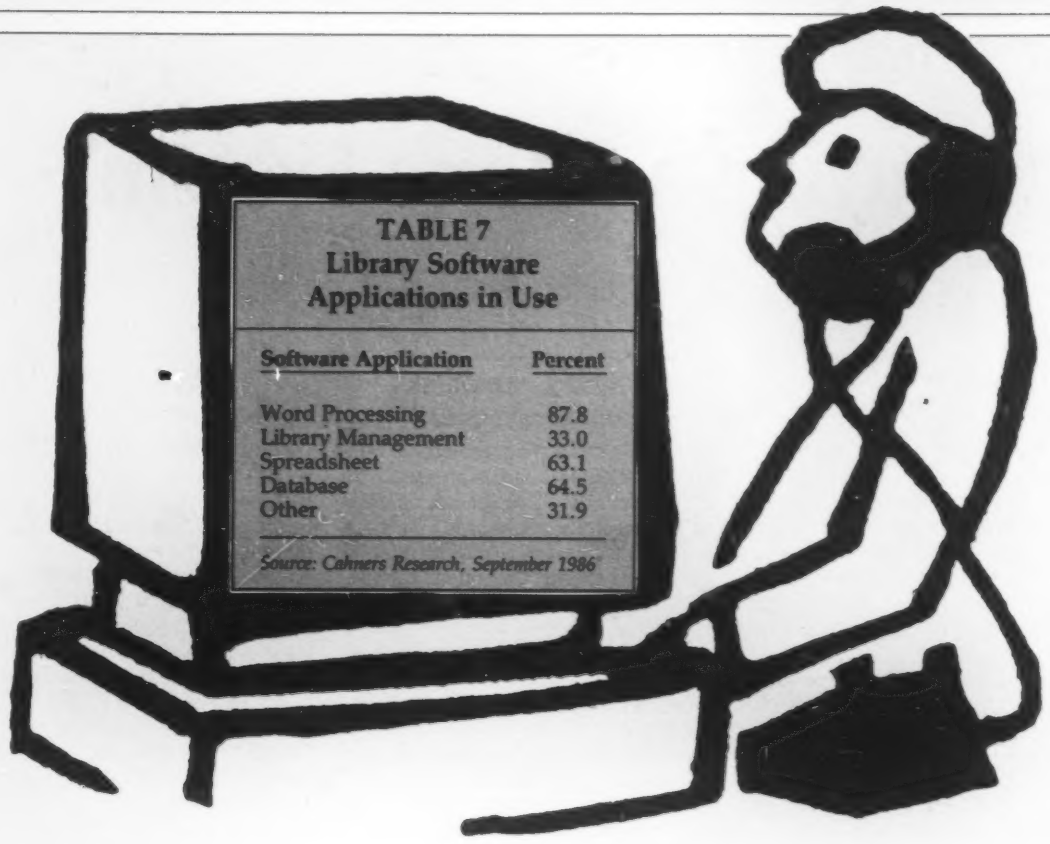

TABLE 7
Library Software Applications in Use

Software Application	Percent
Word Processing	87.8
Library Management	33.0
Spreadsheet	63.1
Database	64.5
Other	31.9

Source: Cahners Research, September 1986

TABLE 8
Type and Number of PCs Planned for Purchase Within Next Two Years by Libraries That Currently Have None

Response	Percent
Plan to purchase PC	
Yes	51.6
No	48.4
Type of PC	
IBM	73.9
IBM Compatible	17.4
Apple	13.0
Others	17.2
Mean number	2.07PCs

Source: Cahners Research, September 1986

Buying a Phone System

By Saul J. Amdursky

THE BLOOMINGTON Public Library's telephone system was always a little worse than a Third World country's immediately following a natural disaster. In 1983, after hearing Joe Matthews advise his audience at the LITA conference in Baltimore to investigate purchasing their own phone systems, a decision was made that "we're mad as hell and we're not going to take it anymore." By the winter of 1984, Bloomington Public had installed its own phone system. This resulted in real dollar savings in the short and long term and a more flexible and adaptable communication system that improved service to the public.

Bloomington had an electromechanical phone system with 20 six-button and two intercom phones when the investigation into buying a phone system for the library began. The system was antiquated and limiting. Many of its flaws impinged on library service.

Only four incoming lines could be handled by the electromechanical system. More importantly, none of those lines offered any privacy. Virtually anyone could pick up a phone inadvertently or intentionally and listen in on any conversation. Holds could be picked up from virtually any phone. This led to patrons being cut off, the wrong line being answered by the wrong person, and private and occasionally sensitive calls being disrupted. The phones could not be moved from one location to another without substantial expense: each instrument was a permanent installation. Finally, the intercom system was difficult and time consuming.

Could the library afford to upgrade and improve the phone system? Was there any other choice? Was the service bad enough to take action? Before a decision could be made, the cost of phone service had to be carefully monitored. This included line charges, equipment rental costs paid to the local phone company, long distance toll charges, and related labor costs.

General Telephone serves the Bloomington-Normal area; they were contacted and asked for a complete breakdown of all charges being assessed against the library. They sent a PIXELL, a difficult and jargon-ridden document that required several calls to the phone company's business office to decipher. Perseverance was ultimately rewarded when all items on the PIXELL were explained.

Once this was done, two things became obvious. First, the library was being overcharged. Rent was being paid on equipment the library had not had for more than two years and, in some cases, had never possessed. Several calls to the business office resulted in a satisfactory credit. Second, once the overcharges were eliminated, the actual monthly costs of equipment rental could be determined. This figure was crucial as it helped decide how much money could be invested in a new system.

Bloomington Public was paying approximately $3000 a year for telephone equipment rental in the fall of 1983. With deregulation these costs were likely to increase. The library board was faced with a choice of borrowing monies from a local bank to purchase a phone system or continuing to pay rent. Before any decision could be made, a market investigation had to be conducted.

Selecting a vendor

Several area vendors of phone equipment were invited to offer proposals on replacing the library's old system. Virtually all of them were happy to visit the library, listen to specific concerns, and develop a proposal. The library wanted a system that would be flexible, would allow for growth, save staff time, eliminate many current problems, be easy to maintain, and be affordable.

Interestingly, only two price quotes were received on electromechanical systems. One from General Telephone would have allowed the library to purchase its already inadequate system for approximately $13,000. Another vendor offered a substantially lower price on an electromechanical system with a line sequencer, a device that airlines and others use to keep customers on hold until the first available representative is able to come to the phone and explain why your reservations have been lost and what your luggage is doing in Beirut. All other vendors strongly recommended that the library investigate the advantages of an electronic phone system.

Desirable features

Research indicated that electronic phone systems offer desirable features that are likely to be increasingly important and impossible to implement on electromechanical systems. The potential for increasing service and accommodating growth is irresistible.

The library receives in excess of 125 calls a day. Between 25 and 50 outgoing calls are made daily. Any new phone system was expected to enhance operations and help the library move from the 19th to the 21st Century quickly and cost effectively.

Privacy is a very important factor. Library administration deals with many sensitive personnel and business matters by phone. Library patrons call with a variety of questions which should be handled confidentially. Therefore, both the public and the entire staff need to be confident that their conversations are pri-

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vate. The electronic phone systems could make the guarantee that lines in use are secure. No one could be added to a call without the knowledge and permission of those already involved in the conversation.

The hold feature of electronic phones is another asset. A normal hold could be answered from any phone in the building. However, by tapping the hold button twice, the hold could be made exclusive to a particular phone. Once a client is on exclusive hold the phone would ring every 45 seconds as a reminder. This prevents forgetting about people on hold.

The intercom system is especially important. Virtually all calls are initially received by the library's secretary or by the circulation staff. Over 80 percent of these calls are then transferred using an intercom system. Electronic phone systems offer a combination of traditional intercom service (dial a number and wait for someone to answer), oral paging, and zone paging.

Oral paging offers the possibility of saving time on 30 to 40 percent of the library's incoming calls. The library secretary, by touching one button, would open a microphone on a selected phone and inform another staff member of a call. The standard response would be "thank you." This works especially well in nonpublic areas. Calls are answered more promptly and the secretary spends less time on the phone. Zone paging creates a quieter library. Rather than use an overhead page and disturb the entire library clientele, electronic phones can be clustered into zones to create less disturbance.

Conference calls are another feature that electronic phones offer. The nicest aspect of this feature is that it can be a time saver. If a third party can be reached by phone for clarification, information, etc., it can prevent hours and sometimes days of playing phone tag.

Memory speed dialing

Every phone system the library investigated offered memory speed dialing. The only things that vary are how many numbers can be stored and whether the numbers have to be stored centrally or can vary from instrument to instrument. This feature was initially viewed as no more than a convenience item but later proved to be very cost effective.

Before the days of 1+ dialing, virtually all discount long distance services required an extensive code to be dialed to obtain access to their network. With memory speed dialing a two-digit number is dialed and the access code is entered automatically. Another two-digit code can be entered and the long distance number would be dialed if it had been stored in the memory. Although this can be done manually, the inconvenience would discourage many people. The library spent approximately $1000 per year on long distance service before installing electronic phones with the speed dialing feature. Cliff Robertson aside, recent bills indicate that the library saves between $200-$300 annually on long distance calls using a discount vendor.

The monitor feature of electronic phones, which makes each instrument a one-way speaker phone, is also attractive. When any staff member is placed on hold, the employee can tap the monitor switch and recradle the phone. The oral aspects of the system alert the staff member when they are taken off hold.

Flexibility, expandability

Electronic phone systems also prove to be very flexible. The old electromechanical phones were connected to thick unsightly cables and, for all practical purposes, were stationary. Electronic phones are portable and interchangeable. For example, Bloomington Public's Community Room has a separate phone jack. A phone is placed there only when a video teleconference is scheduled. The library Board Room has an extension jack that shares the same number as the director's office. When weekly senior staff meetings or board meetings are held the director unplugs his desk phone and moves it next door.

Another important question is expandability. Can the phone system be adapted to keep up with Bloomington's growing population? Investigation indicated that most electronic phone systems would accommodate eight or more incoming phone lines and that cut-over switches for computer communication could be easily and inexpensively installed.

Proposals, presentations

In 1983 there were only three reputable area companies who could offer prices that would allow the library to realize a pay back within five years; 1230 Communications, General Telephone, and Oberlander Communications all offered interesting packages. Only a few hundred dollars separated the three proposals. Two companies were proposing virtually the same system while the third was offering a slightly less sophisticated and less expensive system.

Sales presentations were made to a select committee of the staff by each firm. Staff members were asked to consider how each system would impact on the operation of their department and on the library as a whole. Administration examined the service profiles of each firm, local references, contract extras, and the availability and cost of a service contract after the warranty period. Staff and administration agreed that Oberlander Communications provided the best deal for Bloomington Public.

Oberlander's sales presentation had been superior and their ongoing service agreement cost thousands less than their closest competitors. They had been in business since the 1930s and did several millions of dollars in sales annually. Their references were uniformly good, and they were flexible in their negotiations. Among other features they offered were a cut-over switch for sending and receiving data on a multiline phone and several parallel outlets so that phones could be moved from one work station to another.

Installing the system

Once a decision was made to go with a particular vendor, it took six to eight weeks for the new system to be installed. Oberlander had to wait for a cut-over date from General Telephone. Bloomington decided to buy a 12/36 system using TIE equipment. The library purchased 19 electronic phones, one speaker phone, and two DSS units. A DSS is a switchboard-type unit that allows for the rapid transfer of incoming calls. Simply stated this means that the system can handle up to 12 outside lines and 36 total intruments and that there are two primary areas in the library for intercepting incoming calls. The system was installed in February 1984.

The system is excellent but some features caught everyone off guard. The queuing feature which allows staff members to reserve the first available line when all lines are in use was the last to be installed and offered so many surprises it was removed. The queuing card overrode certain aspects of the intercom feature of the DSS and automatically transferred calls to a given station. Although this would have been a

highly desirable feature under certain circumstances, insufficient time was allowed for answering the call before it rang back to the original DSS station. Therefore, at least for the moment, there is no queuing feature on the system.

Another feature of electronic phones is that they are dependent on a consistent source of electricity. This was brought home very forcefully the last time downtown Bloomington experienced a power outage.

Every library should decide what they want to do about phones. At the Bloomington Public Library a decision was made that service could be improved and money saved by investing in an electronic phone system. After nearly three years it is increasingly apparent that the decision was sound.

Two to three months were spent on research and talking to vendors before a decision was reached. The staff was kept informed of progress and many of them participated in the decision-making process. The system that was purchased allows for greater flexibility, improved customer service, real dollar savings, and savings in staff time. Further, the system is capable of growing with the library. The vendor representative claims the only thing the TIE phones cannot do is accommodate video.

To rent or not to rent

Customers need to be careful when buying phone systems. There are any number of vendors in the marketplace who follow P.T. Barnum's axiom that "there's a sucker born every minute." Before decisions are made, the needs of the library have to be determined, how much money the library can spend must be known, and the vendor has to be thoroughly investigated.

Bloomington Public knew most of its needs when investigation began and discovered a few more as the process continued. Library administration was able to determine that monthly payments on a phone system would only equal the current cost of renting equipment.

A little additional research indicated that the library was eligible to receive tax-free loans from local banks. In essence, the library was able to make a five-year loan for the phone system and pay a very low interest rate. Bloomington resisted the temptation of dealing with very small companies and conceivably saving a few thousand dollars. The field requires a relatively low capital investment to get started and has a high rate of business failure.

Too many phone vendors maintain very limited inventories and only order equipment when they have a purchase order in hand. These same vendors invariably order as much as possible on credit from their suppliers. Therefore, if these businesses experience one or two financial reversals, it is relatively painless for them to simply close their doors and walk away.

There is an old adage that says, "if it's not broken don't fix it." Many people believe this is the advice that the Justice Department ignored when they insisted on breaking up AT&T. Perhaps. The reality is that libraries now are free to make choices about equipment: to rent or not to rent. It is now a very feasible question.

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TABLE 9
CD-ROM Players in Libraries

Questions	Percent
Libraries owning CD-ROM players	
Yes	7.9
No	92.1
Use of CD-ROM player	
Library staff only	72.0
Library staff and patrons	28.0
Model of CD-ROM players owned	
Hitachi	65.2
Philips	17.4
Sony	13.0
Other	4.3
Plans to acquire CD-ROM player(s) in libraries which have none	
Within six months	7.9
Within 12 months	25.0
No plans	67.1

Source: Cahners Research, September 1986

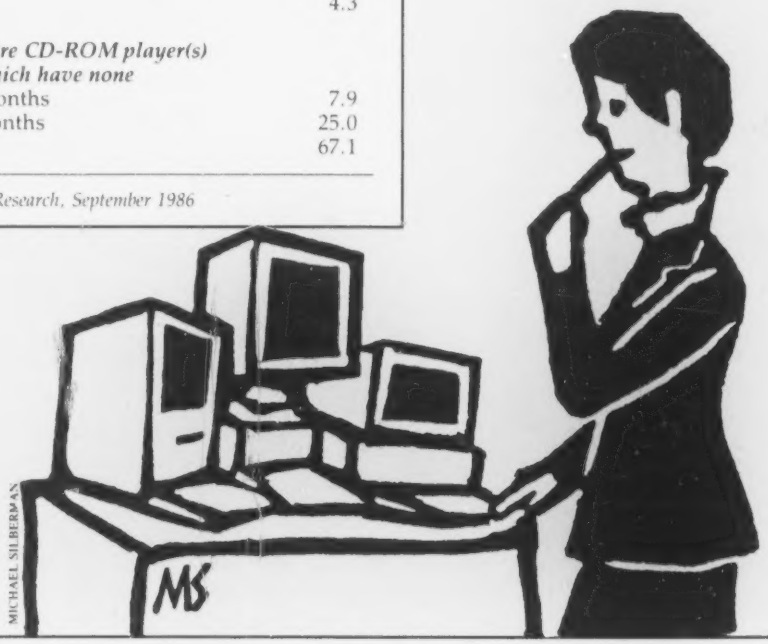

TABLE 10
Staff Involved in Decision Making About Library Technology (Percent)

Decision	Acquisitions	Cataloging Librarian	Reference	Purchasing	Administration
Recognizing need for new technology	38.6	56.2	61.4	11.1	97.4
Determining new technology specifications	30.7	44.3	45.7	13.9	92.3
Final selection of new technology	27.6	37.8	40.3	16.8	96.6

Source: Cahners Research, September 1986